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Two intermediate elementary grade level learning disabled students deficient in reading skills participated in a study to explore the efficacy of utilizing a token reinforcement program combined with behavioral contracting to increase the acquisition rate of sight vocabulary. Word recognition behavioral data were collected by measuring the time interval required for instruction and teacher directed practice and counting the number of new words correctly identified. The results indicated that the intervention was a powerful motivation: one S increased his acquisition rate by 660% over baseline while the other increased his sight word acquisition rate 330% during the same period. Student motivation was influenced by the impact of preference surveys, reward menu, behavior contracts, and a material rewards system. (Author/CL)

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The Effect of a Token Reinforcement Program on the Sight Word Acquisition Rate of Learning Disabled Students in a Rural School Program

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ABSTRACT

Two intermediate elementary grade level learning disabled students deficient in reading skills participated in a study to explore the efficacy of utilizing a token reinforcement program combined with behavioral contracting to increase the acquisition rate of sight vocabulary. The results indicated that the intervention served as a powerful motivation procedure. One student increased his acquisition rate by 660 per cent over baseline while the other student increased his sight word acquisition rate 330 per cent during the same period. Discussion focused on developing stronger internal validity for the contingency management procedure.

The Effect of a Token Reinforcement Program on the Sight Word Acquisition Rate of Learning Disabled Students in a Rural School Program

Comprehension is the purpose of reading. Therefore, instructional methods that focus on the acquisition of word recognition skills are designed to provide students with the requisite tools to gain meaning from print (Learner, 1982). Word recognition is a necessary precondition for comprehension; consequently, if the student merely vocalizes words from a passage without associated meaning, the process of reading remains incomplete. Both word recognition skills and comprehension skills are needed to complete the reading process (Kirk, Kliebhan, & Learner, 1978). Typically, word recognition receives more emphasis in the beginning stages of reading instruction while comprehension receives more emphasis in the more advanced stages of reading instruction (Bond & Tinker, 1973; Ekwall, 1976; Harris & Sipay, 1975).

Although several psycholinguistic authorities (e.g., Goodman & Burke, 1980; Smith, 1978) dispute the necessity of letter and word recognition in the process of learning to read, word recognition instruction in remedial education of slow and disabled students remains a salient factor in the amelioration of their comprehension deficits (Hammil & Bartel, 1978; Hargis, 1982; Spache, 1972). Once diagnostic procedures are accomplished for the purposes of ascertaining the student's reading instructional level, the student's method of decoding unknown words, and the parameters of the student's sight vocabulary, an instructional strategy is designed and implemented to remediate pinpointed deficiencies that inhibit the reading process. When a problem is diagnosed in the area of sight vocabulary, instruction in overlearning words in isolation is undertaken as a prerequisite to learning to recognize words in context (Bryant, 1965; Cohen & Plaskon, 1980).

Overlearning, the process of learning beyond mastery, requires a large expenditure of student and teacher time and effort in drill and repetition

(i.e., practice). Motivation to acquire sight vocabulary under conditions of overlearning may be minimal for the disabled reader (Feldman, 1982).

Other conditions may also exist to inhibit the acquisition of a sight word vocabulary by remedial readers. Wyne and Stuck (1979) noted that minimal academic skills accomplishment may be in part caused by the minimal amount of time such students are actively engaged in the directed learning task. Results from Bloom's (1974) study of the relationship between student time spent on task and academic achievement suggested a positive relationship between the two variables. Time on task increased achievement and increased achievement lead to further increments of time on task behavior. Blaker and Feldman (1982) replicated this finding with primary grade learning disabled children.

It would appear that even with the most appropriate instructional method geared toward the student's strongest learning modality, the teacher may be reduced to accepting less than the desired acquisition rate of sight word vocabulary by the disabled reader. That is, an "optimal" reading instructional strategy is a necessary but insufficient condition for the acquisition of a sight vocabulary. Student motivation and focused attention to the over-learning task combined with prescriptive instruction form the basis for the remediation of sight word deficiencies.

Since there is a paucity of research related to the role of motivation in the reading skills acquisition process of slow and disabled learners (Kirk, Kliebhan, & Learner, 1978), the present study was needed to examine the effect of reinforcement (i.e., rewards) on sight word acquisition. The purpose of this study was to investigate, in an applied setting, the relationship between sight word acquisition rate and a contingently administered token reinforcement procedure employed on two elementary grade level learning disabled students.

METHOD

Subjects

Two students participated in the investigation. One student, "J", was a nine year old male in the third grade. He was noted to have directionality and perceptual problems (e.g., "saw" for "was", "god" for "dog", etc.). The other student, "T", was an eleven year old male in the fourth grade. "T" had repeated his third grade year. He was observed to have difficulty in auditory figure-ground discrimination.

Both boys were diagnosed as learning disabled students. Standardized intelligence test scores revealed that both "T" and "J" had average intellectual function with high verbal performance and low coding scores. Standardized reading tests and achievement tests confirmed that both students were approximately two years below grade level in word recognition.

Their regular classroom teachers observed that the boys' word recognition of high frequency words was extremely limited, and their reading comprehension was remarkably low. Neither "T" nor "J" would attempt to utilize word attack skills on unknown sight words during oral reading. They would either skip those words or make random guesses.

During this study, both students were enrolled in a learning disabilities program primarily to improve their reading skills. They attended the program for a half an hour a day, five days a week.

Setting and Apparatus

This study was conducted in a learning disabilities resource classroom in a public elementary school. The school was located within a rural community in the southwest part of the country.

A standard digital watch calibrated to the second was utilized to measure the length of the sight word instructional period during the entire conduct of

the study.

Other apparatus employed during the baseline phase included reinforcement stickers and stars, individual sight word goal sheets, and word flash cards compiled from the Dolch Basic Word Lists.

During the intervention phase individual student reinforcement preference surveys, material reinforcement menus, and behavior contracts were employed along with word flash cards compiled from the Dolch Basic Word Lists. The students received their rewards on a daily basis following evaluation of new sight words learned.

Target and Behavioral Measures

For the purposes of this investigation, the target behavior, word recognition, was defined as the correct pronounciation of any new word from the Dolch Basic Word List on the first trial in the first session following an instruction and teacher-directed practice session. In this manner, acquisition of a new sight word would require the student to correctly pronounce the new word approximately 24 hours following instruction.

Word recognition behavioral data were collected by measuring the time interval required for instruction and teacher-directed practice and counting the number of new words correctly identified. Dividing the frequency count of new words learned by the instructional session interval produced the sight word acquisition rate. The instruction and teacher-directed practice time was recorded to the nearest minute. Independent student practice time with the sight word flash cards in the resource room was not subjected to measurement and therefore that time interval was excluded from the computation for sight word acquisition rate.

Entry-level sight word recognition behavior was determined for each of the two students prior to the initiation of this investigation. On the Dolch

Basic Word Lists for grades one through three, "T" met the 100 per cent criterion (i.e., correct pronounciation on five consecutive trials) on 70 of 130 words (54%). "J" met the 100 per cent criterion on 42 of 91 words (46%) on the Dolch Basic Word Lists for primer and grade one.

Procedure

Baseline was comprised of seven intervals for "T" and eight intervals for "J". Each interval length consisted of sight word instruction and teacher-directed practice. The teacher timed the length of the presentation and directed sight word drill during each half hour session in the resource room.

Stickers, stars, and teacher praise were utilized with both students during the baseline phase. It was explained to each student that five unknown sight words would be selected by the teacher and printed on an individual goal sheet. Once the student correctly recognized a sight word to the predetermined criterion, sight word acquisition rate would then be calculated and a star placed beside the newly acquired word on his goal sheet. When the student was able to identify the entire set of five words, a sticker would be affixed to his goal sheet. Verbal praise was paired with each of these practices. Goal sheets were taken home following word set acquisition for positive parental feedback.

Instruction consisted of word configuration exercises, word in sentence context exercises, and word flash card reproduction procedures (i.e., say the word, trace the word, write the word). Directed practice employed all of these procedures excluding the configuration exercises. Previously identified words were mixed with unknown sight words during the practice interval for the purposes of overlearning.

Prior to the commencement of instruction, sight words presented in the

last session were reintroduced for evaluation purposes. All five words in the set had to be recognized before the next set of words was introduced to the student.

Following the last session of baseline, a reinforcement survey was orally administered to each student. The teacher recorded their reward preferences. From these surveys, the teacher designed a single reinforcement menu that encompassed both students' preferences. A preliminary explanation of the material rewards menu was made to each student. Both "T" and "J" expressed satisfaction with the menu items and their value level (i.e., the cost of the reward). At this time sight word recognition behavior contracts were drawn up, presented, and explained to each student. Both "T" and "J" understood that they and the teacher were bound by the terms presented in their contracts. With the contracts, the intervention phase began the following school day.

In the intervention phase, instruction and teacher-directed practice were continued along with verbal praise while goal sheets, stars, and stickers were eliminated. Following sight word evaluation at the beginning of the session "T" and "J" were praised for their new word acquisitions and then material reinforcement was "purchased" from their reward menu. Data collection procedures on sight word acquisition rate remained constant over the eight intervals of the intervention phase.

RESULTS

Baseline

Over the baseline phase, "T" learned eight sight words in 147 minutes of instruction. In seven evaluations, he learned from zero to two words while instructional time for acquisition ranged from eight minutes to 43 minutes ($\overline{X}$ = 18 minutes/word). Acquisition rate during baseline ranged from

zero words per minute to .13 words per minute ($\bar{X}$ = .05 words/minute).

"J" learned 15 sight words in 189 minutes of instruction over the baseline period. In eight evaluations, he learned from one to three words while instructional time for acquisition ranged from ten munutes to 40 minutes ($\bar{X}$ = 13 minutes/word). Acquisition rate during baseline ranged from .03 words per minute to .15 words per minute ($\bar{X}$ = .09 words/minute).

Intervention

By the conclusion of the intervention phase, "T" learned 46 sight words in 141 minutes of instruction. In eight evaluations, he learned from five to seven words while instructional time required for recognition ranged from two minutes to five minutes ($\bar{X}$ = 3 minutes/word). Sight word acquisition rate during intervention ranged from .20 words per minute to .50 words per minute ($\bar{X}$ = .33 words/minute). Figure 1 presents T's sight word acquisition rate across baseline and intervention.

"J" learned 23 sight words in 100 minutes of instruction over the intervention period. In eight evaluations, he was able to recognize from two to five words while instructional time for acquisition ranged from three quarters of a minute to eight and one half minutes ($\bar{X}$ = 4 minutes/word). Acquisition rate during the intervention phase ranged from .12 words per minute to .75 words per minute ($\bar{X}$ = .30 words/minute). Figure 2 presents J's sight word acquisition rate across baseline and intervention.

Insert Figure 1 About Here

Insert Figure 2 About Here

DISCUSSION

The purpose of this study was to investigate in a resource room environment, the effects of a contingently administered reinforcement procedure on the sight word acquisition rate of two learning disabled elementary school

students. As the data in Figures 1 and 2 indicate, both students dramatically changed their sight word acquisition rates. While "T" learned eight words in 147 instructional minutes at an acquisition rate of .05 words per minute during baseline, he learned 46 words in 141 minutes at a rate of .33 words per minute during intervention. The sight word rate differential across baseline and intervention was 660 per cent.

"J" learned eight more words during intervention over his baseline total in 89 less minutes of instructional time. His sight word rate differential across baseline and intervention was 330 per cent.

Since the teacher's prescriptive methodology remained constant across baseline and treatment conditions, the systematic introduction of the contingency management procedures appear to be a plausible causal agent in effecting enormous acquisition rate change. Student motivation was influenced by the impact of preference surveys, reward menu, behavior contracts, and the material rewards system.

Future research in the role of motivation in the reading process of slow and disabled learners should be directed toward establishing a stronger case for a cause-effect relationship between the reinforcement program and sight word acquisition rate. Stronger internal validity could be demonstrated by the utilization of either a multielement design, i.e., ABCBC, (Cooper, 1981), a simultaneous treatment design, i.e., AB/CB, (Blackham & Silberman, 1981), AB/CB or a multiple baseline design across students, i.e., extended baseline for second student, etc., (Cooper, 1981). Any of these investigative formats would further delineate the potentcy of the treatment procedure.

Providing a longer investigative period than the 15-16 days in the present study would have allowed the potency of the verbal praise component to be established as the more natural reinforcer on an intermittent delivery

schedule. An extended study could provide the time necessary for slowly fading the material rewards program while attempting to maintain an acceptable sight word acquisition rate.

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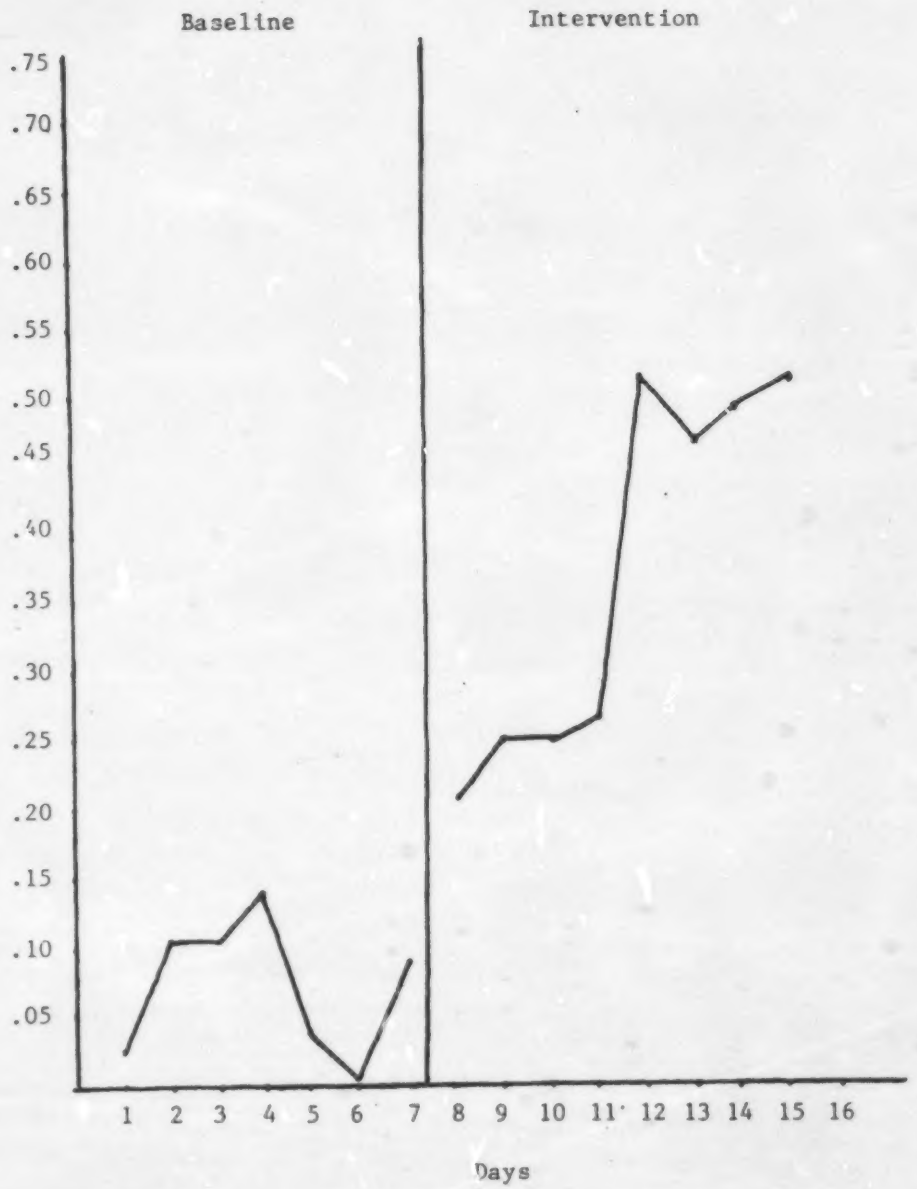

Figure 1. T's sight word acquisition rate over 15 school days.

Table One

T's Sight Word Acquisition Rate
Over 15 School Days: Raw Data Compilation

	Day	Words Learned	Time (Minutes)	Rate Per Minute
	1	1	43	.02
	2	2	19	.11
	3	1	10	.10
	4	1	8	.13
	5	2	47	.04
	6	0	8	.00
	7	1	12	.08
Total	7	8	147	.05
	8	5	25	.20
	9	6	24	.25
	10	5	20	.25
	11	5	19	.26
	12	6	12	.50
	13	7	16	.44
	14	6	13	.46
	15	6	12	.50
Total	8	46	141	.33

Per Cent Change Over Baseline: 660%

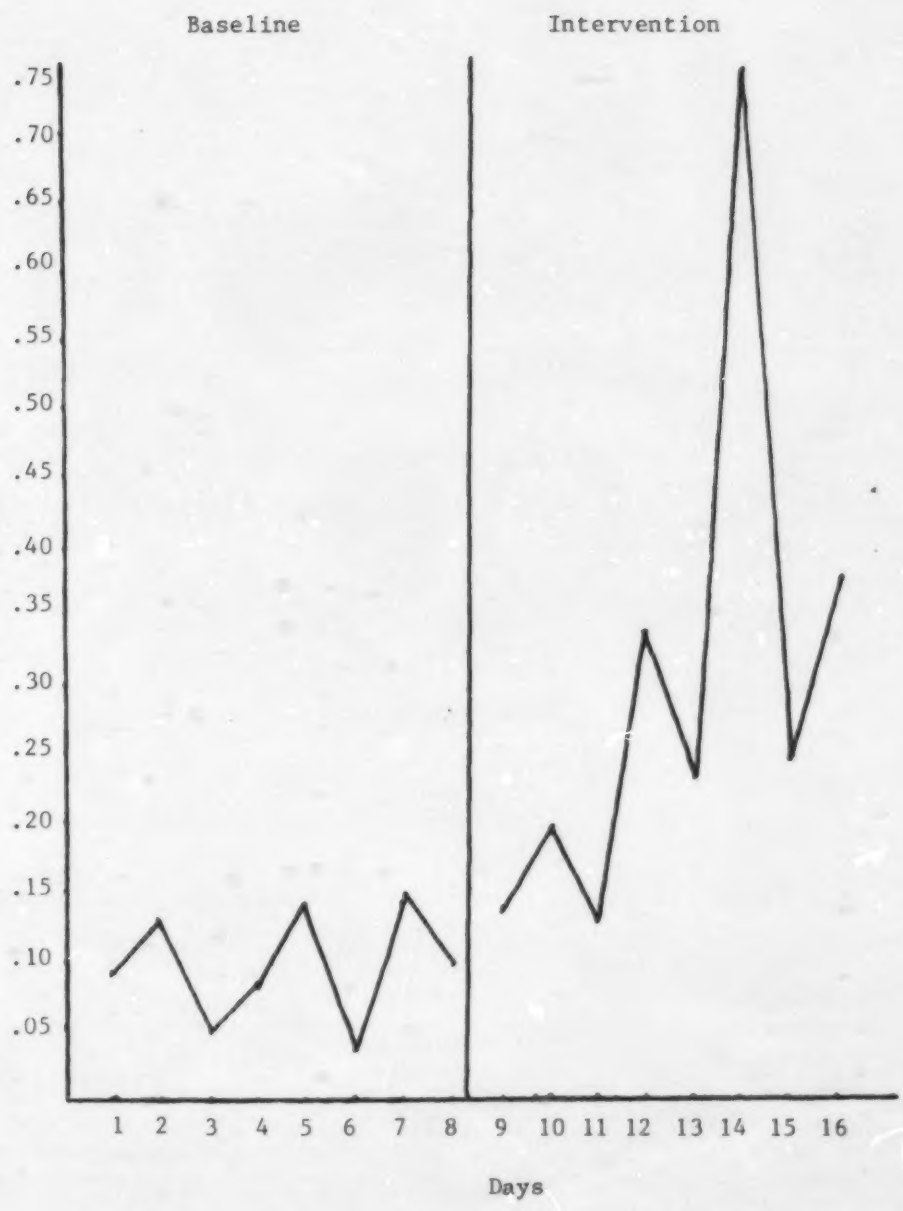

Figure 2. J's sight word acquisition rate over 16 school days.

Table Two

J's Sight Word Acquisition Rate
Over 16 School Days: Raw Data Compilation

	Day	Words Learned	Time (Minutes)	Rate Per Minute
	1	3	35	.09
	2	2	17	.12
	3	2	40	.05
	4	1	12	.08
	5	2	15	.13
	6	1	40	.03
	7	3	20	.15
	8	1	10	.10
Total	8	15	189	.09
	9	4	30	.13
	10	2	10	.20
	11	2	17	.12
	12	3	9	.33
	13	2	9	.22
	14	3	4	.75
	15	2	8	.25
	16	5	13	.39
Total	8	23	100	.33

Per Cent Change Over Baseline: 330%